CLAIMS

1. A water-soluble controlled release composition for eradicating or controlling insects and/or vegetation in a body of water, comprising:

a water-soluble polymer, the water-soluble polymer is present in an amount of from 35.0 to 60.0 wt%;

at least one active agent, the at least one active agent is present in an amount of from 0.1 to 50.0 wt%;

at least one surfactant, the at least one surfactant is present in an amount of from 5.0 to 35.0 wt%; and

a binder, the binder is present in an amount of from 10.0 to 50.0 wt%, wherein:

the binder comprises at least one hydroxyl moiety;

the controlled release composition releases the at least one active agent over a period of from 5 days to 90 days; and

the at least one surfactant is a cationic surfactant, an amphoteric surfactant, a non-ionic surfactant or combinations thereof.

2. The composition according to Claim 1, wherein:

the water-soluble polymer is present in an amount of from 38.0 to 59.5 wt% (e.g. from 45.0 to 59.5 wt%);

the at least one active agent is present in an amount of from 6.0 to 15.0 wt%;

the at least one surfactant is present in an amount of from 7.5 to 22.0 wt%;

the binder is present in an amount of from 22.7 to 40.0 wt%.

3. The composition according to Claim 1, wherein:

the water-soluble polymer is present in an amount of from 38.0 to 59.5 wt% (e.g. from 45.0 to 59.5 wt%);

the at least one active agent is present in an amount of from 0.3 to 2.5 wt%;

the at least one surfactant is present in an amount of from 7.5 to 22.0 wt%;

the binder is present in an amount of from 22.7 to 40.0 wt%.

4. The composition according to Claim 1, wherein:

the water-soluble polymer is present in an amount of from 35.0 to 45.2 wt%;

the at least one active agent is present in an amount of from 1.0 to 25.0 wt%, such as from 1.0 to 1.5 wt%;

the at least one surfactant is present in an amount of from 10.0 to 22.0 wt%; and

the binder is present in an amount of from 22.7 to 30.0 wt%, such as from 22.7 to 25.1 wt%.

5. The composition according to any one of the preceding claims, wherein the water-soluble polymer is selected from one or more of the group consisting of carrageenan lambda, hyaluronic acid, pullulan, polyvinylpyrrolidone, polyacrylic acid, gum acaia, carboxymethylcellulose, microcrystalline cellulose, hydroxypropylmethylcellulose, ethylcellulose, methylcellulose, xanthan gum, maltodextrin, chitosan, carrageenan iota, carrageenan kappa, starch, pectins, salts of alginic acid, lignins, tragacanth, guar gum, polyacrylamide, and poly(2-ethyl-2-oxazoline), salts thereof and copolymers thereof.

6. The composition of Claim 4, wherein the polymer water-soluble polymer comprises at least two polymers, where:

a first of the at least two polymers is selected from the group consisting of carrageenan lambda, hyaluronic acid, dextrans, pullulan, polyvinylpyrrolidone, polyvinyl alcohol, polyacrylic acid, polyethylene glycols, salts thereof and copolymers thereof;

a second of the at least two polymers is selected from the group consisting of gum acaia, gelatin, carboxymethylcellulose, microcrystalline cellulose, hydroxypropylmethylcellulose, ethylcellulose, methylcellulose, xanthan gum, maltodextrin, chitosan, carrageenan iota, carrageenan kappa, starch, pectins, salts of alginic acid, lignins, and salts thereof.

7. The composition of Claim 6, wherein, when the total amount of polymer is taken as being 100 wt% by weight, the first polymer is present in an amount of from 40.0 wt% to 95.0 wt% and the second polymer is present in an amount of from 5.0 wt% to 60.0 wt%.

8. The composition according to any one of the preceding claims, wherein the composition further comprises a crosslinking agent, optionally wherein the crosslinking agent is present in an amount of from 0.1 to 10.0 wt% (e.g. from 0.4 to 5.0 wt%).

9. The composition according to claim 8, wherein the crosslinking agent is selected from one or more of the group consisting of sodium tetraborate, ammonium zirconium carbonate, sodium borate dialdehyde, melamine-formaldehyde, urea-formaldehyde, polyamide-epichlorohydrin, dimethylolurea, a polyfunctional azirdine,

methoxymethylmelamine, a melamine-formaldehyde resin prepolymer, a urea-formaldehyde resin prepolymer, calcium salts, and barium salts.

10. The composition according to any one of Claims 8 and Claim 9 as dependent thereupon, wherein the crosslinking agent is a crosslinking agent for the first of the at least two polymers, optionally wherein the first polymer is polyvinyl alcohol and the crosslinking agent is sodium tetraborate and/or ammonium zirconium carbonate.

11. The composition according to Claim 9 or Claim 10, wherein the crosslinking agent is present in an amount of from 0.3 to 6.0 wt% (e.g. from 0.4 to 4.6 wt%, such as from 0.8 to 4.0 wt%).

12. The composition according to any one of Claims 1, 3, and 5 to 10, wherein the at least one active agent is present in an amount of from 0.5 to 1.5 wt%.

13. The composition according to any one of Claims 1 to 2 and 5 to 10, wherein the at least one active agent is present in an amount of from 7.5 to 9.3 wt%.

14. The composition according to any one of the preceding claims, wherein, the at least one active agent is selected from one or more of the group consisting of biocides, insect pheromones, juvenile hormones, fertilizers, seed germination stimulants, and plant growth regulators, optionally wherein the at least one active agent is a biocide, optionally wherein the biocide is a pesticides (e.g. the pesticide is selected from one or more of the group consisting of herbicides, insecticides, insect growth regulators, nematicides, termiticides, molluscicides, piscicides, avicides, rodenticides, predacides, bactericides, microbicide, spermicides, algicides, nematicides, molluscicides, schistosomacides, larvicides, adulticides, insect repellents, animal repellents, antimicrobials, fungicides, disinfectants (antimicrobial), and sanitizers).

15. The composition according to Claim 14, wherein the at least one active agent is one or more selected from the group consisting of *bacillus thuringiensis serotype israelensis*, O,O,O',O'-tetramethyl-O,O'-sulfanediylbis(1,4-phenylene) diphosphorothioate, and alkyldimethylbenzylammonium chlorides.

16. The composition according to any one of the preceding claims, wherein the binder is present in an amount of from 22.7 to 30.0 wt%, such as from 22.7 wt% to 25.1 wt%.

17. The composition according to any one of the preceding claims, wherein the binder is selected from one or more of the group consisting of an mono-alkoxyalcohol, or more particularly, a dialkoxyalcohol, a trialkoxyalcohol, a poly-alkoxyalcohol and water.

18. The composition according to any one of the preceding claims, wherein the surfactant is a silicon surfactant and/or a fluorosurfactant and/or a polymeric surfactant.

19. The composition according to any one of Claims 1 to Claim 18, wherein the non-ionic surfactant is selected from one or more of the group consisting of ethoxylated linear alcohols, ethoxylated alkyl phenols, fatty acid esters, fatty alcohol polyglycosides, alkylpolyglucosides ethleneoxide/propyleneoxide copolymers, polyalcohols, ethoxylated polyalcohols, thiols (mercaptans), amides and alkylpolyglucosides.

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20. The composition of Claim 19, wherein the cationic surfactant is an ammonium-containing surfactant, optionally wherein the ammonium-containing surfactant is selected from one or more of the group containing dodecylamine acetate, dodecylamine hydrochloride, dodecyltrimethylammonium hydrochloride, benzalkonium chloride, and cetrimonium bromide.

21. The composition according to any one of the preceding claims, wherein:

(a) the composition is provided in a form that the composition fully dissolves into a body of water over a period of from 2 days to 100 days (e.g. from 10 days to 50 days, such as from 30 days to 40 days); and/or

(b) the composition comprises pockets of a gas (e.g. air) within the composition

22. The composition according to any one of the preceding claims, wherein the composition is a buoyant composition.

23. The composition according to Claim 22, wherein the composition is buoyant for a period of at least 2 seconds following its placement into a body of water.

24. The composition according to Claim 23, wherein the composition is buoyant for at least 4 hours, following its placement into a body of water.

25. A method of preparing a buoyant water-soluble controlled release composition for eradicating or controlling insects and/or vegetation in a body of water according to any one of Claims 1 to 24, wherein the method comprises the steps of:

(a) providing a blended mixture comprising:
a water-soluble polymer;
at least one active agent;
at least one surfactant; and
a binder; and

(b) extruding the blended mixture to form an extrudate.

26. The method of Claim 25, wherein the process further comprises:

(c) subjecting the extrudate of step (b) to from one to five further rounds of extrusion.

27. Use of a composition according to any one of Claims 1 to 24 to eradicate or control controlling insects and/or vegetation in an aqueous environment.

28. A method of eradicating or controlling insects and/or vegetation in a body of water, comprising placing the water-soluble controlled release composition according to any one of Claims 1 to 24 into the body of water.